

ABSTRACT

A strong, lightweight, impact resistant helmet system protects the wearer from impact injury and minimizes bodily injury to other players brought into contact therewith during blocking and tackling events. Weight reduction is achieved by reinforcing inner and outer surfaces of the helmet shell with long length, high strength fibers. Orientation of the fibers is such that the fiber lengths are aligned generally in the direction of tension and compression forces imposed on the helmet surface during impact. This reinforcement geometry permits use of a thin helmet shell. Efficient impact absorption by the helmet shell is accomplished by limiting the bend curvature produced at the impact location. The bend curvature reduction increases the contact area between the helmet shell and a second pliable padded inner helmet made from energy absorbing polymeric foam disposed within the helmet shell in contact with its inner surface. The second pliable padded inner helmet rests on the wearer's head, held in place by an attachment mechanism associated with the helmet shell. Energy is absorbed when the inner surface of the helmet shell contacts and compresses the inner helmet. The reduced bend curvature of the helmet shell spreads impact forces over a large area, and the impact load experienced by the wearer is decreased.